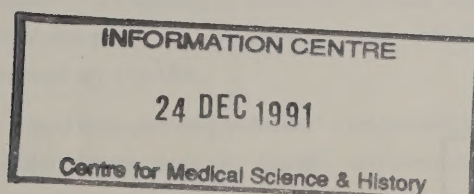




SCIENCE POLICY AND THE EUROPEAN DIMENSION

Government response to the House of Commons
Select Committee on Education, Science and Arts:
Report on Science Policy and the European Dimension

Presented to Parliament by the Secretary of State for Education
and Science by Command of Her Majesty
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HOUSE OF COMMONS SELECT COMMITTEE ON EDUCATION, SCIENCE AND ARTS: GOVERNMENT RESPONSE TO REPORT ON “SCIENCE POLICY AND THE EUROPEAN DIMENSION”

Introduction

1. The Government welcomes the Committee's Report, *Science Policy and the European Dimension*. European collaboration has become an important element of the United Kingdom's scientific effort, through a variety of means: the European Community's research programmes, subscriptions to international facilities and organisations, and not least through informal international contacts between individual scientists. The Government endorses the Committee's views on the part Britain can play within the European science community. To this end it has set in train a range of policies, and related administrative structures, designed to enable a positive input to be made. Underpinning these various measures, the Government has expanded the public resources available for domestic and international research work funded through the Research Councils by 23% in real terms over the years 1979–80 to 1991–92, and in the 1991 Autumn Statement announced further real terms increases in each of the following three years. Against the background of this significant record of substantially increased financial investment, the Government has to differ from the Committee's views concerning the current level of funding for the domestic science base.

2. As noted in evidence to the Committee, the Government's general policy towards European scientific collaboration is to support research which:

- is not already under way domestically or through other international channels, and where added value from collaboration will exceed the unavoidable extra costs involved;
- is complementary to existing national and international activities;
- improves the quality of European science, including the scientific capabilities of its manpower, and which offers scope for technology transfer;
- is aimed at improving industrial competitiveness or tackling trans-border issues such as health, environmental protection, or economic problems;
- involves large-scale investment with sharing of costs and risks.

On this basis, the UK has been able to participate effectively in a variety of major European initiatives to the acknowledged benefit of UK science and technology.

3. The Committee noted that most new activity in science and technology in Europe now takes place within the EC's Framework Programmes. With the significant increase in resources devoted to basic science within these Programmes in recent years, it is vital that our scientists are able to get maximum benefit from these funds. Accordingly, the Government places emphasis on:

- involving itself fully in decisions about the scope and content of Framework Programmes through the Council of Ministers and other EC bodies;
- participating in the management arrangements for individual elements of the Programmes, with the assistance of expert advice from the UK scientific community;
- by these means ensuring that the UK achieves the maximum value for money from the activities pursued, and that they are consistent with the UK's domestic scientific priorities.

4. These objectives notwithstanding, it is only through the health of domestic science, which still commands the great majority of the Government's funding of civil research and development, that the UK will be able to participate fully in European collaboration. The Government has a well co-ordinated set of policies spanning science education and research, which aim to set the right conditions to sustain and increase the UK's scientific potential. Some of the main elements of these policies are set out in the following paragraphs, with reference to the Committee's own views and analysis.

Science in Schools

5. The teaching of science in schools is the foundation of a robust scientific community. The Government has placed a high priority over recent years on the need for change and improvement in the standard of education generally, and in the promotion of science education in particular. The early introduction of science within the National Curriculum emphasises the importance with which the Government regards science for the all-round education of every pupil. Through the National Curriculum all pupils from the age of five to sixteen should receive a sound science education.

6. As the Committee notes (para 54) this will only succeed with a committed, competent and highly motivated teaching force. The Government is implementing decisive policies to ensure there is an adequate supply of properly trained and qualified teachers of science. To increase the recruitment of science teachers, the Government introduced a Bursary Scheme for trainee teachers undertaking a PGCE or shortened BED in physics in 1986. This was extended in 1989 to chemistry and in

1991 to all sciences. These bursaries are worth £2,000 per year in physics and £1,500 per year in the other sciences. Experience has shown that the bursaries lead to a significant increase in recruitment (17% in chemistry in 1990 for example), and that although the effect diminishes over time, they nevertheless contribute to a higher level of recruitment than would otherwise obtain.

7. In addition, the Government has developed with the advice and support of the Interim Advisory Committee (IAC), a school teachers' pay structure which gives considerable discretion to Local Education Authorities and individual schools to make additional payments to teachers selectively in the light of local needs and circumstances. The Secretary of State for Education and Science has implemented in full the IAC's recommendations for 1991–92. Greater use can now be made of enhanced local discretions, which can be used to help fill posts in key shortage subjects (such as mathematics and physics), and to reward good teaching. Incentive allowances increased in value by 30% on 1 December 1991 and are now worth up to some £7,200. Nearly 200,000 allowances are now available, making it possible for over half of all teachers to receive one. Accelerated incremental progression and incremental enhancements of up to nearly £1,100 can boost the pay of individual teachers, and schools can extend the top of the pay scale by up to £3,000 to reward teaching excellence. The maximum possible salary for a classroom teacher outside London is almost £28,000.

8. In 1991–92 the Government has allowed £150m—about 1.5% of the pay bill—for use at local discretion, on top of resources available for the very substantial increases in the standard pay scale and the value of incentive allowances. As a result, there is now very considerable scope for schools to offer financial incentives to make teaching an attractive career for able people with science qualifications. The remit given to the new School Teachers' Review Body for advising on teachers' pay in 1992–93 stresses the case for discretionary payments and improving the rewards for good classroom teachers.

9. It is equally important, as the Committee notes (para 55), to ensure that existing teachers are kept abreast of new developments through satisfactory in-service training. The Government recognises that this plays a crucial role in raising standards in science education, as in all National Curriculum subjects. In 1991–92 the Government's programme of specific Grants for Education Support and Training will include £76m for in-service training related to the National Curriculum. Particular courses have been designated for the training of primary teachers who will act as curriculum leaders in science. In addition, the National Curriculum Council and the School Examinations and Assessment Council are providing substantial levels of support. This is

mainly in the form of advice on the implementation of the National Curriculum and assessment, including in particular distance learning materials on primary science:

10. The proportion of tuition in secondary school science provided by teachers with no post-A-level qualification in any science is very low. Retraining of teachers therefore primarily focuses on the conversion of teachers qualified in only one science to teach balanced science across all three principal subjects. The Department of Education and Science has supported a distance learning package, "Physics for Science Teachers", developed by the Open University. The pack, which became available in 1988, has been well-received and more than 1,000 teachers have used it so far. A similar pack has been commissioned from the Open University for chemistry teachers, the first part of which will be available in 1992.

Science in Higher Education

11. The future of science and technology in the UK, in pure research and research-related industry, depends on the supply of highly skilled manpower from Higher Education Institutions (HEIs) through postgraduate research. The Government is determined to ensure that this remains at an adequate level. The postgraduate studentships offered by the five Research Councils play a major role in encouraging able students to study for a higher degree in science. Demand for these studentships is extremely buoyant: the number offered and taken up in 1990-91 amounted to 7,300, compared with a total of just under 6,400 in 1989-90.

12. The Committee suggested (para 52(ii)) that the creation of a twin-track route to a PhD might encourage more students to work for a PhD in science. This would comprise five-year salaried research assistantships combining research with teaching or demonstrating, and a limited number of three-year studentships (at the same rate of pay) for the most able. HEIs are free within the aggregate resources at their disposal to offer salaried posts combining PhD research with teaching or demonstrating; however, it is unlikely to be cost-effective for the Research Councils to support a five-year PhD. A report on the Research Councils' long term strategies for postgraduates is currently being prepared by a special sub-committee of the Advisory Board for the Research Councils (ABRC), and will be put to the Secretary of State for Education and Science.

13. The Government expects the Universities Funding Council (UFC) to advise on the effectiveness of the New Academic Appointments Scheme (NAAS) of "new blood" lectureships (para 52(iii)), and any implications for spending priorities in the future, as part of its annual advice to the Secretary of State for Education and

Science on the public expenditure needs of universities. For the three years from 1991–92, the Government has provided £20m a year for the continuing costs of NAAS.

14. The Committee also recommended (para 52(i)) the creation of a “proper career structure for those wishing to pursue a research career”. The Government shares the Committee’s view that there should be opportunities available for researchers to pursue satisfying and worthwhile careers. But it is for institutions to determine their own staffing, including the balance between posts combining teaching and research and those which are for research only. There can be valuable links between research and teaching. It must also be recalled that research is not only done in HEIs, and many researchers are seeing the benefits of transferring their knowledge from the laboratory to industry, where the number of scientists and engineers employed increased by 10% between 1981 and 1989.

15. In HEIs and Research Council Institutes (RCIs), the balance of staffing between permanent and fixed-term posts is a matter for the employing institutions within the total resources at their disposal. Most full-time staff engaged wholly or partly in research in HEIs and RCIs are still in permanent posts, although the rapid increase in universities’ income from research contracts in recent years, which the Government welcomes, has led to the number of researchers on fixed-term contracts increasing as a proportion of a higher overall total, as well as widening the available pool of scientific talent.

16. The Government recognises the importance of effective management of these fixed-term contract staff. This is a matter for institutions in discussion with funding bodies. In the Autumn of 1990, the Committee of Vice-Chancellors and Principals of the Universities of the UK (CVCP) and the Association of University Teachers issued a document containing recommendations covering a wide range of good practice in the management of researchers on fixed-term contracts. The Research Councils are also considering this question.

The Public Profile of Science

17. Taking science education in its widest sense, the Government shares the Committee’s view (para 56) that more can and should be done to increase the profile and status of science and scientific careers in the country as a whole. As the Committee commented, the scientific community itself has a key role to play in this, not least in bringing to a wider audience the intellectual excitement and challenge involved in the scientific enterprise. The Government therefore welcomes the role played in this by the Research Councils, the Royal Society, the British

Association for the Advancement of Science and others (including the broadcasting media). The Committee on the Public Understanding of Science, whose aim is to improve public awareness of science and technology and its achievements, provides a particularly valuable impetus. The DES is represented on this Committee. The Government nevertheless recognises that there is scope for further development in this important area and urges all those involved, in both public and private sectors, to consider how best the general objective can be furthered.

Research Funding

18. The Government is fully committed to maintaining a healthy UK science base. In 1990–91, some £3,100m was spent on civil science by the Government, over half of which was used to support the science base. The Science Budget provides one component of the dual-funding system for the support of research at universities and over the past 11 years it has increased in real terms by 23%. The additional resources announced in the 1991 Autumn Statement provide for a real terms increase of 2.5% for 1992–93, and further increases in each of the following two years. The funds provided to universities through block grants for research have also increased in real terms; UFC funding on research-based criteria increased by some 10% in 1991–92—well ahead of inflation—in line with the overall increase in available funds through the UFC grant and publicly-funded tuition fees.

19. The new framework set out in the Higher Education White Paper (Cm 1541) will strengthen the science base by bringing about more competition for general research funding and increase selection in its allocation. This coupled with the changes in the dual support boundary, which clarify the respective funding responsibilities of HEIs and the Research Councils, will ensure the most cost-effective use is made of the substantial public funding for research, and that research opportunities are opened up for high-quality departments throughout higher education.

20. The Committee recommended (para 65) that the public funding of civil research and development be increased to match that of France and Germany. It is important to recall that international comparisons of Government funded expenditure do not take account of the important role played by the private sector. Government policies in the UK in recent years have been designed to cut back on “near market” public expenditure, which it is more appropriate for the private sector to undertake. While recession has affected the position in recent years, up to 1988 there was substantial growth in such private sector investment.

21. To continue to secure these results, the Government recognises that the science base requires sound facilities for research. However, in the light of the increasing provision for the science base, discussed in paragraph 18 above, the Government believes that it should be for the Research Councils and HEIs to determine the priorities to be accorded to equipment. In view of the rapid advance in laboratory instrumentation, it is unrealistic to expect that all laboratories can be maintained at the leading edge. Nevertheless, the funds made available to the science base are sufficient to support selectively within the UK internationally competitive research.

22. On the particular point raised by the Committee on international costs (para 65), increases in the costs of international research programmes are already taken into account in the allocation of the Science Budget. As part of that annual process, due regard is given to international costs by the ABRC in determining its advice to the Secretary of State for Education and Science on the distribution of the Science Budget to the individual Research Councils.

The “ Brain Drain ”

23. The Committee expressed concern about the so-called “ brain drain ” (para 58) and recommended a study of its extent and causes. Such concern is not, of course, new and considerable effort has been expended in recent years on analysis to establish the facts of the matter. The best available information is collected by the Universities’ Statistical Record. This reveals a net inflow of staff from abroad over the period 1980–89. 11% of Research Council funded research students completing their studies in 1989 went into employment overseas. In the early 1960s, a Royal Society study found that 35% of newly-qualified PhDs went abroad.

24. Subjective judgements concerning quality, as opposed to quantity, are sometimes advanced in debate on this issue. Using grade as a proxy for quality, at the most senior level twice as many professorial staff have come into the UK than have left in the last two years. However, the numbers involved are very small; relatively speaking, indeed, movement of academic staff at all levels, both into and out of the UK, is on a very small scale. Nevertheless, the Government will continue to monitor the situation.

The Value of European Collaboration

25. As paragraph 4 above indicates, the Government believes that its policies are creating the right framework in which UK science can develop, both domestically and in the international arena. Focusing on Europe, the Committee made a number of recommendations and

comments (paras 10, 13, 18, 25, 26) about the value of international and European scientific collaboration, with which the Government fully agrees.

26. As the Committee stated, scientific research is increasingly international, and the UK will continue to develop and strengthen international links. These links create a range of benefits such as the cross-fertilisation of ideas, and new technologies and processes, as well as establishing standards and research protocols. It is essential for British science to keep in touch with international scientific developments if the UK is to stay in the forefront of world science. To realise these potential benefits most fully, the Committee suggested that the promotion of scientific collaboration must continue in a wide variety of ways and different organisations. The Government fully subscribes to this view. As the memorandum submitted by the DES to the Committee stated, the Government seeks to foster a diversity of European scientific organisations.

The European Community

27. The Government also concurs fully with the Committee's perception of the need for a "forward" policy in relation to the EC. Every effort is made to achieve this through systematic early consideration of UK aims, followed by subsequent discussion with other Member States and EC officials. Several programmes in the Third Framework Programme (1991–94) owe much to UK initiative in their instigation and formulation. The Government accepts that this input, informed by discussions involving the British scientific community, must be sustained. Indeed, the Government is already preparing for the Fourth Framework Programme, which under the normal cycle of overlapping programmes would run from 1993 to 1997, and is considering UK scientific priorities for discussion in due course with other Member States and with the European Commission.

28. The Government is also in full agreement with the Committee's recommendation on the principle of subsidiarity, ie that the EC should only fund research which could not be done as well or better at a national level. The Government firmly opposes any weakening of this principle.

29. The Government is fully committed to maximising the UK's return from EC research spending. This will both further reinforce the UK's research base, and bring a welcome increase in international collaboration between UK institutions and those of our partners in the EC. The UK already receives a good return from the EC Framework Programme; the Committee specifically recognised (para 42) that the UK has done well in obtaining EC research and development funding.

Funding Arrangements

30. This return has been achieved without the aid of special support for EC Framework Programme grants. The Committee has however suggested that the Government should create a special “top-up fund” (para 37) for HEIs, to increase the level of overheads received on EC contracts to a level comparable with a Research Council grant, paralleling the dual support system.

31. The dual support system for the funding of Research Council projects at HEIs currently requires institutions to meet the overhead costs of the projects from within their general funds. In July 1991 the Secretary of State for Education and Science confirmed that new arrangements for the dual support system would be introduced from August 1992. Under these arrangements, Research Councils will be responsible for meeting the full costs (including overheads) of those projects they sponsor at HEIs, apart from the salaries of permanent academic staff and general premises costs. This is a quite different regime from that which operates for EC research contracts, and so the dual support system does not, in the Government’s view, provide a helpful model for the funding of EC research contracts at HEIs.

32. It is for institutions to determine their use of block grant and other funding according to their own priorities. Within the aggregate resources at their disposal, it is open to institutions to set aside specific funds for EC research projects. Success in attracting EC research grants is a factor taken into account in the UFC’s research assessments, and through these it affects the grant to individual universities. In the light of this, the Government does not consider that there would be any benefit in restricting the flexibility already available to institutions by channelling any additional funds via a centrally-managed pool rather than by the Funding Council route to HEIs for spending at their discretion.

33. The Government believes that there is some scope for redeployment of research funding within HEIs. In recent years, HEIs have made use of their academic flexibility to take on an increasing volume of commercial research. University income from commercial research (including that commissioned by Government Departments) was some £340m in 1989–90, an increase of nearly 60% in real terms over 1984–85. Although this is expected to be self-financing, a significant part of this growth has been at marginal cost.

34. The Hanham Report, published by the CVCP in 1988, emphasised the importance of universities determining prices for commercial work by reference to a realistic assessment of full costs. While there is encouraging evidence that universities have improved

their cost-recovery procedures, there is scope for further gains. This will require realistic assessment of the costs of research by both HEIs and research sponsors, including Government Departments. However the onus must be on HEIs, as the suppliers, to carry out work only on a realistic basis. If universities succeed in increasing cost-recovery in line with the CVCP's guidance, that should free substantial resources for other research, including that funded by the EC.

35. Given that HEIs are free to redirect their resources in this way within their overall research priorities, and that in practice non-HEI research institutions account for a sizeable part of the UK's receipts from the Framework Programme, meeting the associated overhead costs from their own funds, the Government does not believe that it would be equitable, cost-effective or desirable to provide additional funding for specific EC or other external research programmes.

Ministerial Representation

36. The Committee in general endorsed the machinery by which the Government deals with science in the EC. It also recommended (para 47) that the Parliamentary Under Secretary of State at the DES with responsibility for basic science should accompany the Parliamentary Under Secretary of State for Industry and Technology to meetings of the EC's Council of Research Ministers.

37. The Government regards this suggestion by the Committee as interesting and has given it very careful scrutiny. It recognises that a number of other European countries are represented at the Research Council by the Minister or Ministry with responsibility in the basic science field. However, it believes that there are persuasive arguments in favour of maintaining a single voice in discussions and negotiations conducted at ministerial level. Most particularly, there would be a risk of giving confusing signals in Europe on the UK's overall priorities for the content of the Framework Programme if more than one Minister were to handle the negotiating line at the Research Council.

38. The current arrangements take careful account of the interests of the basic science community. The Chief Scientific Adviser plays a key role in the formulation of the UK position. Both directly and through the Whitehall Committee structure, he and his staff maintain a regular dialogue with members of the UK science community; and he also accompanies the responsible DTI Minister to meetings of the Research Council. Furthermore, the Government seeks to ensure that, wherever appropriate, representatives of the UK Research Councils sit on the Management Committees which assist in the development and implementation of specific programmes.

39. In the light of these considerations, the Government has concluded that it would be in the UK's best interests to maintain the arrangement whereby a single Minister attends the Council. The content of the current Framework Programmes is such that DTI policy responsibilities continue to predominate. Accordingly, the Government considers it appropriate that the responsibility should remain with the Parliamentary Under Secretary of State for Industry and Technology.

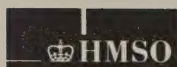
Additionality

40. Finally, the Committee made a specific request (para 24) that it be demonstrated that funds from EC research and development programmes are genuinely "new money" (the principle of "additionality"). The requirements of Community law, as they relate to the principle of additionality, concern payments to Member States from the Structural Funds, not payments under the Framework Programme; and the UK complies fully with those requirements.

41. The arrangements whereby responsibility for Community expenditure on research and development is allocated to Departments are based upon the cost to the UK of contributing to the EC budget to finance Community research and development programmes, rather than upon payments to the UK from those programmes. Public sector receipts are available to be spent in full, normally because the arrangements for allocating costs provide for such receipts to offset any reduction that would otherwise be made in the domestic programme of the Department concerned. Most receipts (over 90% of the UK total) go directly to the private sector and are, therefore, similarly available to be spent in full. This is also the case for HEIs which, though private sector institutions, receive public sector support.

Conclusion

42. The scope for scientific collaboration with European partners, both within the EC and without, is expanding. The Government welcomes these developments where they are consistent with the general principles outlined in paragraph 2 above. It will pursue policies which will enable British science to continue to exploit the opportunities Europe offers, and which will keep the UK at the leading edge of international science. The Committee is to be congratulated for bringing these important matters to a wider public.



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